

**Global Warming Solutions Act of 2008 Hearing
Senate Committee on Global Warming & Climate Change
State House, TBD
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**Testimony of:
Undersecretary for Environment, Phil Griffiths
Undersecretary for Energy, Barbara Kates-Garnick
Assistant Secretary for Energy, Steven Clarke**

Thank you Mr. Chairman and Members of the Committee for the opportunity to share remarks on behalf of Energy and Environmental Affairs (EEA) Secretary Richard Sullivan regarding how EEA has been implementing the Global Warming Solutions Act (GWSA) since the passage of this landmark piece of legislation in 2008.

Climate change is a shift in long term weather patterns: temperature, wind, precipitation, and more. There is a scientific consensus that our climate is changing as a result of global warming caused by human activities that produce greenhouse gas (GHG) emissions, and there is evidence that the climate in Massachusetts has been changing, particularly in the last thirty years.

Today we are planning to do the following:

- Indicate the broader clean energy framework that provides the context for the GWSA Implementation Plan
- Provide a snapshot of the current status of GHG emissions
- Discuss the status of our GWSA Implementation Plan
- Indicate other ongoing measures and planned approaches to developing a clean energy sector in the Commonwealth, some of which complement the specific work with the GWSA.

Before we specifically address the plan, we want like to highlight the robustness and success of Massachusetts clean energy agenda. We have been recognized as national leaders on multiple fronts.

As we are all aware, Hurricane Sandy and other recent strong storms provided us with glimpses of our potential new ‘normal’ – super storms that wreak havoc on our coasts and major cities, causing great damage to life and property. Climate change is not some abstract threat to us far off in the future, but is happening now in real time.

Thanks to the leadership of both Governor Patrick, and the Legislature, Massachusetts now has the most ambitious GHG emissions reduction limits of any state in the entire country. This leadership has led to results and great progress that we are happy to share with you. Below is a list of what I would characterize as our most visible and recent successes in terms of climate change and clean energy:

- Massachusetts successfully worked to lower the emissions cap for the Regional Green House Gas Initiative (RGGI), the nation’s first cap and trade system that includes most Northeastern states.
- We surpassed California again as the #1 state in the nation for energy efficiency as ranked by the American Council for an Energy Efficient Economy (ACEEE).
- Our clean energy sector is vibrant and growing fast – it employs over 70,000 people throughout the Commonwealth in almost 5,000 companies, with a growth rate of over 11% last year, a growth rate higher than that of the overall Massachusetts economy.
- We have experienced historic growth rates in our renewable energy sector as well – Massachusetts has one of the fastest growing solar and wind energy sectors in the nation. In just five years our solar energy sector grew from 3 MW to over 240 MW and our wind energy sector grew from 3 MW to over 100 MW,

well on our way towards Governor Patrick's ambitious goals for both of these sectors.

- And we are poised to be the hub for offshore wind energy through the development of the New Bedford port, the innovative construction and current operation of the Wind Technology testing Center, and hosting the nation's first offshore wind energy farm, Cape Wind.

Massachusetts Greenhouse Gas Emissions Snapshot

The Patrick Administration made implementing the GWSA a top priority, and Secretary Sullivan has mobilized his entire EEA team to do so. We are pleased to report that we have made significant progress to date with implementing the GWSA, and have been working very closely with our partners throughout the Administration, legislature, stakeholder groups, and other states to ensure that the Commonwealth continues to play a leading role in reducing GHG emissions.

The GWSA mandates that the Massachusetts Department of Environmental Protection (MassDEP) produce a GHG inventory every three years. The first GHG inventory covered the years of 2006, 2007, and 2008. This inventory shows a significant 11 percent drop in annual GHG emissions from our baseline year of 1990 to draft 2009 emissions.

In addition

The GWSA requires EEA to complete a progress report every 5 years that ascertains progress with and challenges to implementing the GWSA. We are currently developing the first 5 year report which is due January 1, 2014. In the interim, Secretary Sullivan has decided to issue annual EEA GWSA progress reports in order to keep the public better informed of the GWSA implementation

process. We completed our first annual report for 2012 earlier this year and an electronic copy is located on our EEA GWSA website at www.mass.gov/eea/gwsa.

While we cannot take full credit for this reduction in GHG emissions - this observed reduction in total GHG emissions is influenced by a variety of factors, some beyond our control, such as the recession, weather patterns that affect the amount of energy used for heating and cooling, and increased use of natural gas - it is good news, and the overall goal of EEA's 2020 plan is to ensure long-term GHG reductions through energy efficiency, sustainable transportation and land use planning, and other strategies.

To recap, the GWSA mandates a minimum 80 percent reduction of GHG emissions economy-wide by 2050 and called upon EEA, in consultation with other state agencies and the public, to establish a 2020 GHG emission limit target between 10 and 25 percent below 1990 levels and to develop a plan to reach that target. EEA subsequently set the most aggressive GHG target possible for 2020 at 25 percent below 1990 levels, and subsequently developed and released *The Massachusetts Clean Energy & Climate Plan for 2020* ('The 2020 Plan) in December 2010, a 136-page plan that contains a "portfolio" of established and new measures that reduce energy waste, save money, and stimulate the adoption of clean energy technologies, thereby creating jobs while simultaneously reducing GHG emissions.

Our approach has been to integrate a range of policies such as the Green Communities Act (GCA), The Renewable Portfolio Standard (RPS), and Regional Greenhouse Gas Initiative (RGGI) into our energy and climate strategy. Across state government agencies like The Massachusetts Department of Transportation (MassDOT) or Massachusetts Department of Environmental Protection (MassDEP) are developing other pioneering strategies like GreenDOT or the Clean Energy Performance Standard (CEPS). These new, nation-leading policies are born out of the GWSA GHG emission limits.

Implementation Status: Focus on Implementation and Monitoring

Organization

EEA is now in the implementation and monitoring phase of the Plan. Secretary Richard Sullivan put in place the organizational framework for implementation by creating an internal agency wide team within EEA that works with the support of EEA's Commissioners who have dedicated key staff members to chair and address five Implementation Subcommittees: Buildings, Energy, Transportation, Non-energy emissions, and Adaptation.

This approach ensures a high level of internal coordination among the EEA agencies, and extends leadership to other Secretariats, including the Executive Office of Housing and Economic Development (EOHED), MassDOT, and The Massachusetts Clean Energy Center (CEC). In 2012, the Implementation Subcommittees conducted a thorough review of each strategy within the 2020 Plan in order to ascertain the status, development and progress of each strategy. The Implementation Subcommittees also identified supplemental strategies that were not included in the 2020 Plan and that could provide GHG emission reductions beyond the 2020 Plan strategies

External Advisory Committee Secretary Sullivan also convened an Implementation Advisory Committee (IAC), a process for inter-agency and inter-secretariat collaboration, and a mechanism for stakeholder participation.

In appointing and convening members for the IAC, the Secretary sought to include a broad base of interests for advising on energy and environmental issues. The IAC includes representatives from business and industry, academia, environmental advocacy groups, and other stakeholders.

The IAC replaces its predecessor, The Climate Protection & Green Economy Advisory Committee (CPGEAC), which was focused on the development of the 2020 Plan, and met for the last time in January of 2012. EEA also had convened a Climate Change Adaptation

Advisory Committee that studied and made recommendations for adapting to climate change. EEA established both of these committees in accordance with Sections 8 and 9 of the Climate Protection and Green Economy Act.

Phil Griffiths, EEA Undersecretary for Environment, and Barbara Kates-Garnick, EEA Undersecretary for Energy, co-chair the IAC. To date, the IAC met in June and September in 2012, and in January 2013. We anticipate two more IAC meetings this year, one in June and another this fall. IAC meetings are open to the public and publicized in advance on the EEA GWSA website. Since its June 2012 kickoff meeting, the IAC has focused on assessing the current status of the 2020 Plan's strategies, developing supplemental GHG emission reduction strategies, and further developing the climate change adaptation process and prioritizing strategies related to preparedness and protection of infrastructure and human life.

EEA Clean Energy and Climate Plan Performance Management System

Our capacity to accurately measure the status of and progress we make with each of the strategies in the 2020 Plan is critical to ensuring we comply with the 2020 GHG emission limit.

We are pleased to announce that the Barr Foundation awarded EEA with a \$230,000 grant in September of 2012 to develop a Clean Energy and Climate Plan Performance Management System (CCPMS). The CCPMS will monitor and evaluate the success of the Commonwealth's GHG emissions reduction strategies, and communicate this information to the public. When completed, the system is expected to serve as a regional and national model that other states can adopt to analyze their efforts to reduce GHG emissions.

EEA is currently developing the CCPMS and plans on it being operational in late 2013.

Since an effective performance management system requires high quality data and meaningful metrics, the EEA GWSA Team is in an

intensive stage of developing metrics to evaluate strategies for GHG emission reductions and we recently launched a “Dashboard” to communicate progress via the GWSA website. The ongoing data analyses, metrics development, and performance management system design will enhance capacity for policy evaluation and reporting going forward.

Additionally, in collaboration with The Environmental League of Massachusetts (ELM) EEA launched a preliminary dashboard with policy-related metrics this morning. The CCPMS is scheduled for completion in October 2013. EEA will also release a summary report with an update on progress in the fourth quarter of 2013.

Associated Administration Approaches to GHG Reduction and Clean Energy since the Promulgation of the GWSA

GWSA Regulations

The GWSA requires MassDEP to issue regulations to help ensure declining GHG emissions. Many of the reductions that we have proposed in the 2020 plan come from policies that do not require new regulations to be effective, for example, increased energy efficiency and utilization of renewable energy. However, there are reductions that will be spurred by new regulations, and MassDEP is putting those regulations into place. For example, we are close to issuing in draft form regulations which will result in steep reductions in carbon emissions from power plants under RGGI. We have also finalized regulations to reduce GHG emissions from vehicle tailpipes and vehicle air conditioning refrigerant leaks.

Greenhouse Gas Reporting regulation 310 CMR 7.71: As directed by GWSA, MassDEP has promulgated regulations requiring annual GHG reporting by large facilities and by retail electricity sellers. Facilities report GHG emissions to a regional GHG registry (The Climate Registry)

Regional Greenhouse Gas Initiative (RGGI) regulation 310 CMR

7.70: MassDEP promulgated initial GHG reduction regulations for power plants in January 2008 as part of a regional effort, RGGI. In February of this year, nine states agreed to lower the regional carbon dioxide emissions cap from the current level of 165 million to 91 million tons per year. An independent analysis concluded that the first three years of the RGGI program (from 2009 through 2011) resulted in:

1. \$1.6 billion in net present economic value added to the region, and \$400 million to Massachusetts;
2. Electricity consumers overall – households, businesses, government users, and others – enjoying a net lifetime gain of nearly \$1.1 billion, as their overall electric bills drop over time;
3. A lowering by more than \$765 million in the total dollars that Massachusetts and the RGGI states send outside the region in the form of payments for fuel;

If the proposed changes are adopted across the region Massachusetts estimates an additional \$350 million in allowance auction revenue will be collected for 2012-2020. As per the GCA, this will be invested primarily to help Massachusetts businesses and residences become more energy efficient. MassDEP and DOER are currently finalizing draft regulations for public comment and public hearing anticipated to be held this summer.

Low Emission Vehicle (LEV) Advanced Clean Cars Program

Amendments to regulation 310 CMR 7.40: As required by state law, MassDEP finalized amendments to the Massachusetts LEV regulation in December 2012, making those regulations consistent with California standards to reduce tailpipe GHG and refrigerant leakage emissions from vehicles.

Amendments to Lower Sulfur Content of Distillate Oil & Residual

Oil in regulation 310 CMR 7.05: MassDEP promulgated regulations in 2012 reducing the allowed amount of sulfur in fuels, which in

addition to reducing sulfur emissions also means that furnaces and boilers operate more efficiently, causing lower fuel use, saving money and reducing all combustion-related emissions, including GHGs. The benefits will be experienced by all oil users - residential, commercial & industrial - providing a win-win-win for health, the environment and pocketbooks.

Sulfur hexafluoride reductions draft proposed regulation 310 CMR 7.72 and refrigerant leak reduction draft proposed regulation 310 CMR 7.73:

To implement strategies detailed in the *Massachusetts Clean Energy and Climate Plan for 2020* (CECP), MassDEP drafted regulations that would limit GHGs that have a particularly high global warming potential, particularly sulfur hexafluoride used by electric distribution companies in switchgear, and certain refrigerants used in non-residential refrigeration systems. The draft sulfur hexafluoride regulation is currently undergoing review by the governor's office, while the draft refrigerants regulation is under development at MassDEP.

Amendments to Incorporate US EPA's Tailoring Rule for Greenhouse Gases to regulation 310 CMR 7.00: Appendix C:

As a consequence of the 2007 U.S. Supreme Court ruling that GHGs are "air pollutants" under the federal Clean Air Act (CAA), EPA issued a "Tailoring Rule" that established an applicability threshold for GHG emissions in the title V Operating Permit program that MassDEP implements. In order to conform to EPA's Tailoring Rule, MassDEP has proposed amendments that add an applicability threshold for GHG emissions.

Highlights

In the interest of time we will not provide a detailed update on each of the 27 strategies within the plan, but instead will highlight a few significant developments:

1. Energy Efficiency

- a. The energy used to heat, cool, and light buildings accounts for a large percentage of our GHG emissions.

Our statewide energy efficiency plans provide the single largest GHG emission reduction of any strategy in our 2020 Plan (7.1%).

- b. The central component of our buildings sector strategies are our nation-leading energy efficiency plans which since the GCA have been expanded to pursue 'all cost-effective energy efficiency'. The 3-year plans are developed under the direction of the Energy Efficiency Advisory Council (EEAC), reviewed by our Massachusetts Department of Public Utilities (DPU) and implemented by the gas and electric program administrators (PAs).
- c. The 2020 plan mid-range estimate was 7.1 million metric tons of savings from these EE plans by 2020, which we estimate will likely have to be revised down due to the economic recession and fall in natural gas prices. Despite the impact from these macro-economic factors the plans are being implemented well.
- d. We have just ended the first 3-year plan period from 2010-2012, and the preliminary results show significant progress: From 2009 to 2012 energy efficiency savings have more than doubled.
- e. Electric EE savings have grown from 0.92% of annual retail sales in 2009 to over 2% of annual sales in 2012.
- f. Gas EE savings have grown from 0.46% to over 1% of annual retail sales.
- g. The new 3 year plan from 2013-2015 continues this trend with annual savings projected to rise to 2.6% of retail electric sales in 2015, and 1.19% of retail gas sales in 2015. The support of the legislature and the willingness of

all stakeholders to come to the table in a constructive way, and the robust oversight and evaluation of these programs have made this leadership possible.

h. Economic Costs and Benefits

- i. The economic impact of this is an increase in investment from \$1.6B over the 1st 3 year plan to \$2.2B in the current 3 year plan. Funding for this investment comes from a combination of sources. For the current 3 year plan 85% comes from customer bill charges, with the additional funding coming from RGGI, and the value of energy efficiency on the Forward Capacity Market. This investment is driving down total energy costs for customers in a number of ways.
 1. Direct annual savings of 3,700 GWh of electricity and 72 million therms a year, leading to lifetime savings of over 40,000 GWh of electricity and 937 million therms.
 2. This level of energy efficiency results in downward pressure on wholesale electric prices, which saves money for all ratepayers not just program participants.
 3. Holding down the rate of growth of electricity and gas, saves billions of dollars in deferred infrastructure investments, which makes the modernization and expansion of our electric and gas supply a more manageable cost.
 4. While the \$2.2B investment comes primarily from customers, they will receive over \$6B in lifetime benefits, from the current 3 year plan.

i. Other new initiatives worth highlighting include:

- i. Efficient Neighborhoods - getting to underserved areas (primarily Gateway cities)

- ii. Commercial Real Estate – new working group to better serve an area with significant potential for increased investment
 - iii. Statewide database to feed GWSA data tracking across all PAs.
- j. Advanced Building Energy Codes
- i. The BBRs has a public hearing scheduled for the next update to the building energy code the IECC2012 next month – May14th, and this code represents approximately a 15% energy and GHG improvement over the current baseline IECC2009 energy code.
 - ii. The IECC2012 code was heavily influenced by the earlier development and adoption of the MA stretch energy code in 2009.
 - iii. To date we have 122 communities in MA who have voluntarily chosen to adopt the stretch energy code- primarily as part of their commitment to becoming Green Communities – under the criteria established in the 2008 Green Communities Act.
 - iv. Following the adoption of the IECC2012 energy code, DOER, DPS and other agencies will be looking at the option to update the 2009 stretch energy code, and will actively pursue stakeholder input on that process as and when it begins.
 - v. Looking further to the future, hearings on the IECC2015 begin next week in Dallas, Texas, and will be voted on by ICC members including the State of MA and several municipalities in New Jersey in the fall. Once again, MA hopes to play a constructive role in the development of the IECC2015 code, that we are subsequently required to adopt in 3 years time.
 - vi. The housing lending crisis of recent years had a dramatic effect on the rate of new construction in

the residential market in particular, as well as impacting investment levels in existing commercial and residential buildings. As a result, while GHG emissions are down from this sector, so too are our projected energy savings from advancing building energy codes – as fewer buildings built translates into fewer energy savings opportunities. It is difficult to predict what impact that will have on 2020 GHG savings, but we are beginning the process of evaluating likely GHG savings scenarios, and will likely revise down the 1.6million metric tons estimated for this policy by 2020.

2. Coordinated Regional Procurement & Clean Energy Imports/Large Hydro

- a. Massachusetts and New England in general, has a vast amount of untapped renewable energy resource potential. Massachusetts alone has over 6,000 MW of potential offshore wind energy just a few miles off our coast.
- b. All of the New England states are interested in using coordinated regional procurement as a potential mechanism to reduce over-all delivered cost to customers. Apart from the RPS programs, a role for regional procurement may also be useful to cost-effectively procure large scale hydro and necessary transmission from Canada to New England.
- c. Governor Patrick proposed a resolution last July of 2012 at the New England Governor's Conference & Eastern Canadian Provinces (NEGC-ECP) which directs The New England State's Committee on Electricity (NESCOE) to continue the coordinated regional procurement process and release a Request for Proposals (RFP) for renewable energy projects before the end of 2013. The resolution

was adopted unanimously by the other five New England Governors, and NESCOE has made significant progress on this historic regional initiative since then.

- d. NESCOE has convened a procurement team and legal team composed of senior energy and legal policy makers from each of the six New England states, and these teams have developed a draft RFP and Power Purchase Agreement (PPA). Bidders who respond to the RFP will be eligible and competing for long term contracts with the regions' utilities. NESCOE is in the process of determining when to release the RFP and how best to coordinate with some of the states existing long term contracting processes.
- e. The New England states recently directed NESCOE to coordinate the development of a regional large hydro strategic plan with its ongoing coordinated regional procurement process.
- f. Massachusetts does not foresee any need to change our RPS or include large scale hydro because large scale hydro is a mature technology that does not need support from our RPS but we are supportive of the cost competitive impact, resource diversification and environmental benefits that including hydro in our region's energy mix will bring. We will continue to work with all of the New England states on coordinated regional procurement of both renewable energy and large scale hydro.
- g. Clean energy imports, including large hydro, onshore wind, and offshore wind projects, will play a key role in our regional energy future, and help reduce our GHG emissions. The Patrick Administration continues to spearhead Massachusetts regional leadership on this

issue that will help us meet our GWSA GHG emission limits.

3. Adaptation

- a. In response to the GWSA, EEA convened a stakeholder advisory committee in 2009 to analyze strategies for adapting to the predicted impacts of climate change in the commonwealth.
- b. Committee members had a broad range of expertise, representing government, advocates, academia, and businesses.
- c. EEA filed the Massachusetts Climate Change Adaptation Report with the legislature in 2011 and outlined over 200 potential strategies in Natural Resources/Habitat, Public Health, Infrastructure (energy, water, wastewater, solid waste, transportation), Economy (manufacturing, services, agriculture, forestry, fisheries, healthcare, education), Government, and Coastal Zone and Ocean.
- d. In 2012, EEA convened the Adaptation Implementation Subcommittee to prioritize and implement the adaptation strategies presented in this report.
- e. Participants include state and federal agencies, municipalities, regional planning agencies, not-for-profit organizations, and academia. As a result of this focus on climate change adaptation, state agencies have been involved in climate change adaptation activities such as evaluating existing capabilities, resources, and programs; securing funding for surveys, outreach, and inventory assessments; and assessing vulnerabilities of their resources.

- f. Following Hurricane Sandy, Secretary Sullivan directed the Adaptation Subcommittee to prioritize strategies related to emergency preparedness and protection of critical infrastructure and human life.
- g. Secretary Sullivan also directed the Adaptation Subcommittee to work closely with the IAC, other Secretariats, and a broad swath of external stakeholders to identify and prioritize Adaptation action items.

4. Clean Energy Performance Standard

- a. The 2020 Plan discusses the possibility of Massachusetts implementing a Clean Energy Performance Standard (CEPS) in order to reduce GHG emissions associated with electricity used in Massachusetts. The CECP did not project possible GHG emission reductions, instead indicating that possible reductions should be investigated. Therefore, a research study has been initiated jointly by EEA, MassDEP, DOER, the DPU, and with funding from CEC. The research study seeks to:
 - i. Investigate advantages and disadvantages of various approaches that could be taken to implement a CEPS to reduce GHG emissions from the electric sector.
 - ii. Estimate costs and GHG emission reductions that could be achieved from various levels of, or approaches to, a CEPS using transparent assumptions that are consistent with existing programs in Massachusetts that are reducing or will reduce GHG emission from the electric sector.
 - iii. Detail the approach, successes, difficulties and status of CEPS in other jurisdictions.

- iv. Determine how a CEPS might interact with existing renewable energy and emission policies such as the RPS, RGGI, or GCA.
- v. The research study is expected to be complete by the end of summer 2013.

5. Renewable Thermal & Cooling

- a. The market for renewable heating and cooling (solar hot water, air or ground source heat pumps, clean biomass boilers) in Massachusetts is growing but small. Increasing the market share of renewable heating and cooling technologies at an accelerated pace will enable the Commonwealth to address a series of important challenges.
- b. It will help Massachusetts meet GHG reduction targets, increase energy efficiency, and improve air quality.
- c. It will also help decreasing dependency of heating fuels that are either costly (oil, propane, electricity), constrained (natural gas), or both.
- d. The CECP includes a modest target for solar hot water (0.1 million ton CO₂), and recognizes the bigger potential of the full portfolio of renewable heating and cooling technologies. But it stops short of setting a hard renewable thermal target including all renewable thermal technologies. To achieve 2 million ton CO₂ reduction in 2020, growth rates of the renewable thermal market need to significantly increase. The IAC has endorsed this as a potential supplemental CECP strategy.
- e. The Massachusetts Legislature recently turned its attention to the Alternative Portfolio Standard (APS) as a potential vehicle to support renewable thermal technologies. A report released by DOER at the end of

2012 concluded this may be an opportune way of going forward. Legislation to this effect has since been introduced by Senator Finegold (S.1593). This legislation is supported by a coalition of thermal industry organizations.

- f. DOER and CEC are currently rolling out pilot programs supporting solar hot water, biomass and heat pump installations with grants.
- g. A woodstove change-out pilot around New Year with the support of MassDEP was particularly successful and awarded \$ 1.2 million.
- h. Going forward, schools and public housing are a particular focus for the installation of these new appliances.

6. Electric Vehicles (EV)

- a. The transportation sector is number one in terms of GHG emissions and deployment of zero emission vehicles, such as plug-in hybrids and battery or fuel cell electric vehicles (EVs) are a key component towards helping the Commonwealth achieve its ambitious GHG emissions reduction goals.
- b. We recently launched the Massachusetts Electric Vehicle Incentive Program (MassEVIP), which will provide funding to municipalities across the Commonwealth to help purchase electric or plug-in hybrid passenger vehicles. The program will also provide funding to communities for the installation of dual electric charging stations.
- c. This \$2.5 million incentive program will encourage increased deployment of advanced technology vehicles in cities and towns, reduce reliance on foreign oil, improve

air quality, and help us reduce GHG emissions from the transportation sector.

- d. In March, EEA and the Conservation Law Foundation (CLF) hosted an EV Roundtable meeting, attended by more than 90 stakeholders. The Roundtable focused on ways to increase local awareness of EVs and strategies about how to incentivize their deployment across Massachusetts. The Massachusetts Electric Vehicle Initiative (MEVI) was created to ensure on-going, active participation of stakeholders and Roundtable participants and greatly accelerate the number of clean vehicles registered in the Commonwealth and make them easier to use.
- e. There are approximately 1000 Massachusetts registered electric vehicles on the road today. A shift from petroleum based transportation to electric driving will significantly reduce emissions from our transportation sector and we recognize that it is time to increase the number of these vehicles sold in Massachusetts.
- f. We have made progress towards early EV adoption such as:
 - i. Working at a community level to reduce driver's "range anxiety" and establish a visible fueling network - the state provided funding to municipalities to install 140 charging stations in optimal locations across the state bringing our state's total to over 390 public charging points in our state (more than any other New England state and close to the number in NY who has over twice the number of registered vehicles)
 - ii. Recognizing that a regional approach is a more successful strategy than working just within our

borders, our agencies partnered with other Northeast and Mid-Atlantic States to create a *Transportation and Climate Initiative* (TCI) with environmental, energy and transportation agency participation to help with planning activities and develop a number of guidance documents on EVs for use in the region

- iii. In March, our office along with the Mass. Clean Cities program at the DOER and CLF, hosted a stakeholder meeting attended by 90 thoughtful participants who gave us over 50 suggestions on how to increase the awareness of these vehicles and incentivize their sale and use. In the coming months, we will be working with teams of outreach and incentive groups to act on those ideas. A website has been created to inform and obtain continued feedback and we will make some early announcements about incentives and outreach soon.

g. EV Facts

- i. Although the up-front costs of an electric vehicle (EV) are greater than a gasoline-fueled vehicle, owners of EVs will save thousands of dollars on fueling cost over the life of the vehicle. EVs cost an average of 2 cents/mile compared to gasoline vehicles that cost 14 cents per mile. The driving equivalent to gasoline is about \$1/gallon.
- ii. Even when EVs are charged with electricity generated from fossil fuels, less GHGs are emitted than a conventional gasoline fueled vehicle. In addition, because the Northeast power grid relies on natural gas and renewable energy, electricity

generated in the Northeast is among the cleanest in the country. ZEVs in the Northeast, EVs can reduce GHG emissions by over 46% compared to an average gasoline vehicle.

- iii. Since electricity is generated almost entirely by domestic sources, we can decrease our dependence on foreign oil imports. Over the lifetime of an EV, the owner can save more than 6,000 gallons of gasoline.
 - iv. EVs not only decrease GHG emissions but also significantly reduce smog forming emissions and particulates, air toxics and organic emissions that contribute to aggravated asthma, heart attacks and premature deaths
 - v. Because electricity is almost entirely generated by domestic sources, electricity costs are lower than petroleum and not subject to price volatility. Thus EV owners can benefit from a reliable and cheap source of energy to power their vehicles.
- h. The EV market is very promising. National sales are exceeding historical hybrid sales in the U.S. and the vehicle prices continue to drop. Consumers have more choices than ever and I see our role as becoming a regional leader to make it easier for our citizens and businesses to own, fuel and drive these clean cars.

Thanks again Mr. Chairman and Members of the Committee for the opportunity to update you on the significant progress The Patrick Administration has made to date implementing the GWSA. We look forward to continued collaboration with all of you in order to ensure that the Commonwealth continues to be a national leader on climate change policy and meets all of our ambitious GHG reduction goals.